FACT SHEET FOR NPDES PERMIT WA-002935-1
CITY OF NORTH BEND

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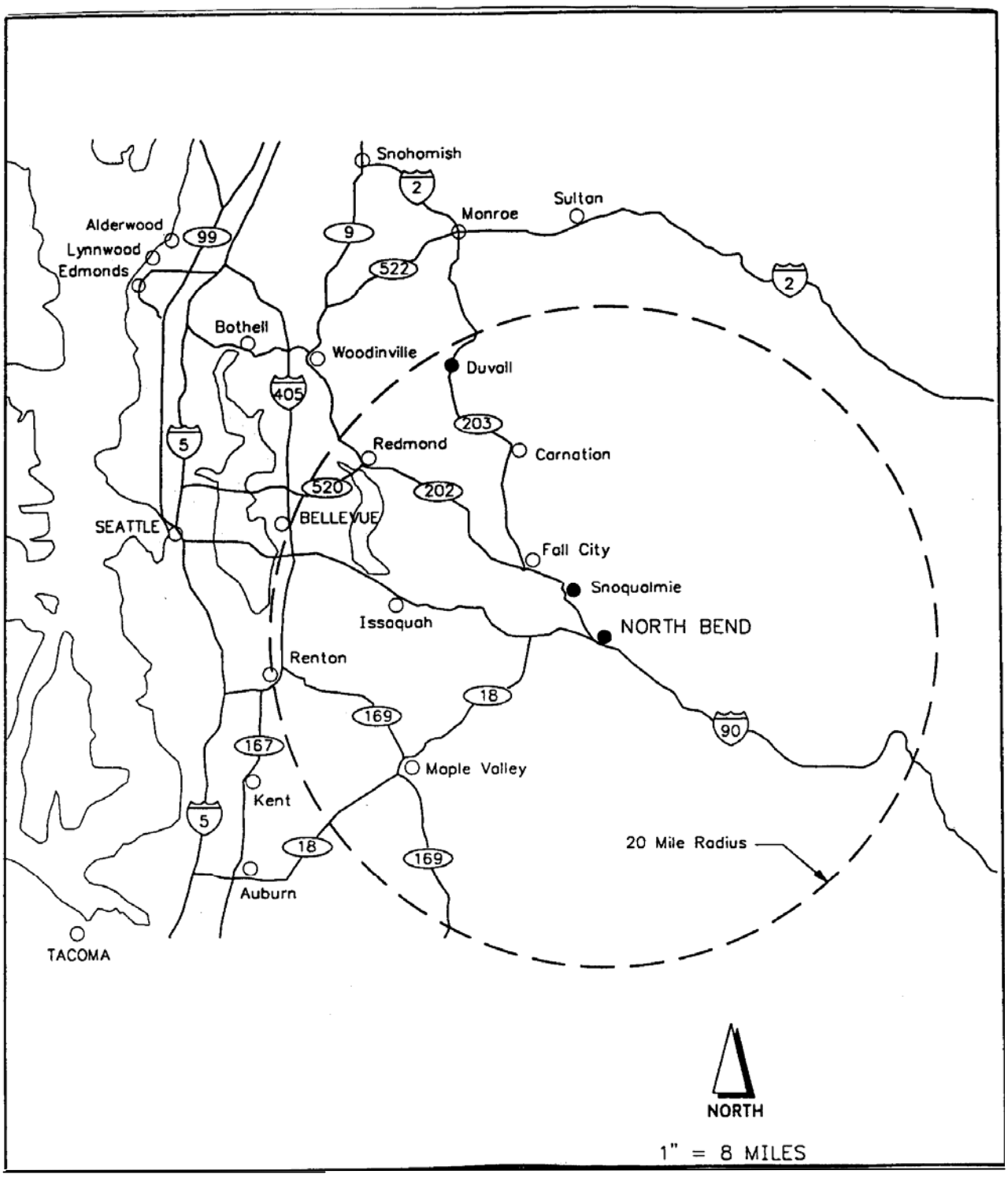

Figure 1B. Vicinity Map – City of North Bend WWTP

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the Wastewater Discharge Permit Program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A—Public Involvement of the fact sheet for more detail on the public notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D—Response to Comments.

GENERAL INFORMATION	
Applicant	City of North Bend
Facility Name and Address	North Bend WWTP 400 North Bend Way North Bend, Washington 98045
Type of Treatment	Secondary Treatment – Oxidation Ditch
Discharge Location	South Fork of the Snoqualmie River Latitude: 47° 29' 52" N Longitude: 121° 47' 3" W
Waterbody ID Number	WA-07-1110

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

SYSTEM HISTORY

The City of North Bend encompasses approximately three square miles. The original portion of the sanitary sewer system, including the wastewater treatment plant (WWTP), was constructed in 1950 and 1951. The original wastewater treatment plant provided only primary treatment before discharging the wastewater effluent to the South Fork of the Snoqualmie River. In 1978, the wastewater treatment plant was modified to accommodate secondary treatment by the addition of an oxidation ditch. The size of the wastewater collection service area did not grow significantly until the 1980s. All of the additions to the system have either been to the east or to the south of the core area. The most extensive additions have been in the commercial area west of the South Fork of the Snoqualmie River adjacent to the South Fork/I-90 Interchange.

As of today, the City maintains only one sewage lift station. Two additional sewage lift stations are privately owned and maintained. The City of North Bend system serves 940 customer connections.

OVERVIEW OF EXISTING SYSTEM

The sewage treatment facility receives primarily domestic sewage from the City of North Bend. The primary treatment consists of bar screening and aerated degritter/grit removal. The secondary treatment facility consists of aeration, comminution, extended aeration, secondary clarification, and disinfection with an ultraviolet system.

The extended aeration is provided in an oxidation ditch with surface rotor aerators. The sewage is stabilized by an oxidation process in which organisms convert a portion of the organic matter in sewage into more stable activated sludge floc. The activated sludge floc is then settled in secondary sedimentation tanks. A portion of settled sludge is wasted and the rest is returned to the oxidation ditch for further stabilization and is mixed with incoming raw sewage.

The waste activated sludge is digested and thickened in an aerated sludge holding tank. The sludge has been hauled to the city of Edmonds WWTP where it is incinerated in a fluidized bed sludge incinerator. Since the completion of Phase IIC Improvement Project in August 2005, the City has been processing the sludge with the new biosolids dryer in-house. The dried solids will be hauled to a local landfill.

COLLECTION SYSTEM STATUS - INFLOW AND INFILTRATION

The collection system in the older part of town has had significant infiltration and inflow problems which have contributed to hydraulic overloading of the wastewater treatment plant during wet weather. The Infiltration and Inflow (I&I) study conducted by the City in 1986 indicated that unsound sewer lines were contributing excessive I/I to the collection system and recommended that improvements to the collection system be conducted in two phases. The Phase I improvements were constructed during the summer of 1998 and resulted in the

replacement of 6000 lineal feet of sewer mainlines and associated side sewers from the main to the property lines. The Phase II - Infiltration & Inflow Improvements were constructed during the fall of 2003, which included the 2650 lineal feet of 8-inch HDPE sanitary sewer pipe, 1175 lineal feet of 6-inch diameter PVC side sewer pipe, and four manholes. The City received a State Revolving Fund totaling $919,000 for the Phase II improvement project. Flows to the WWTP have shown a significant decrease.

SYSTEM IMPROVEMENTS

Since 1998, the City has implemented the following sewer system improvements:

Date	**Improvements**
1998	WWTP Phase I – Secondary Clarifier
1998	I/I Phase I Improvements
2000	WWTP Phase IIA – Ultraviolet Disinfection, Effluent Pump Station
2003	WWTP Phase IIB- Effluent Reuse (3W system)
2003	I/I Improvement Phase II
2004	WWTP Phase IIC – Sludge Dryers, Rotors in Oxidation Ditch

A portion of the Phase II improvements (specifically Phase IIA and B) has been completed. The facility has recently completed Phase IIC improvements in August 2005. The remainder of the Phase II work, which consists of new influent pumps, headworks, anoxic selectors, outfall pump, and odor control system, has not yet been scheduled.

WASTE LOAD

Figures 2 and 3 show the hydraulic and organic loading to the plant from November 1999 through December 2004, based on data submitted in the discharge monitoring reports. The graphs indicate that the plant will likely operate within the hydraulic design criteria, but may occasionally exceed the BOD design criteria (Figure 3), even after Phase IIC improvements are complete.

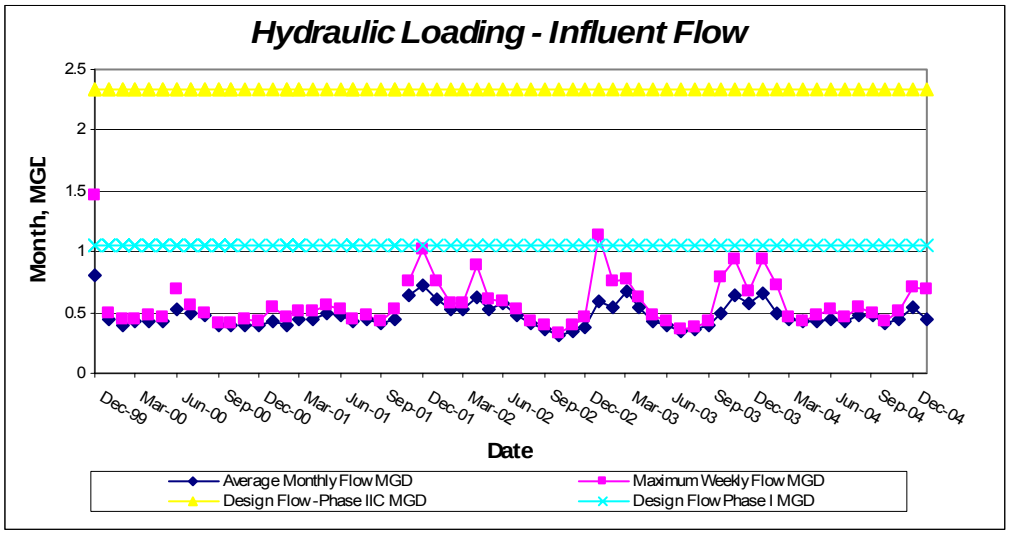

Figure 2 – Influent Flow, November 1999 through December 2004

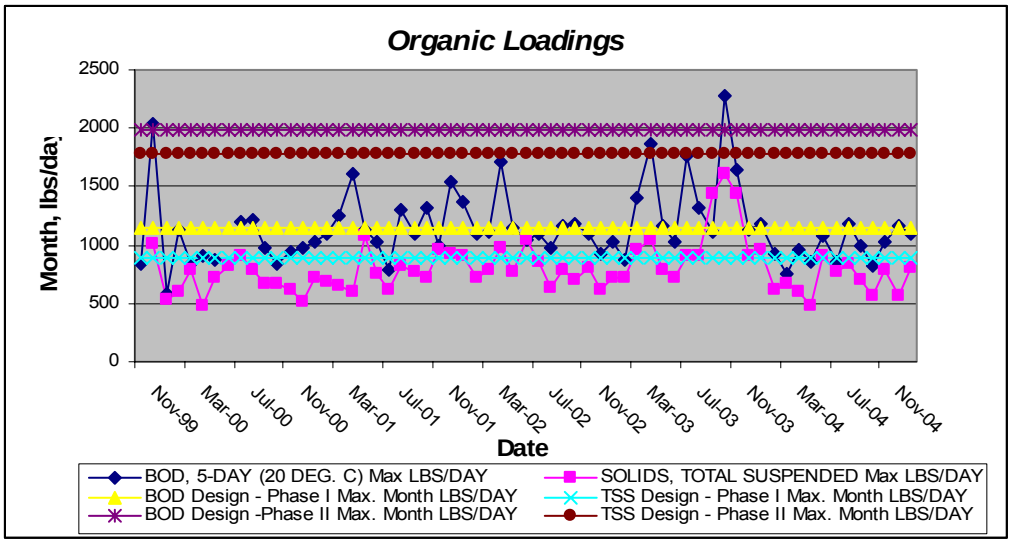

Figure 3 – Organic Loading, November 1999 through December 2004

RESIDUAL SOLIDS

Solids were from the secondary clarifiers, the return activated sludge is held in tanks, which was previously part of the aerobic digester system. The original aerobic digester had a coarse air diffuser for mixing. However, the City currently does not use the mixing or aeration equipment and has elected to haul all sludge to the city of Edmonds for disposal. Until recently, Sumas Trucking Company has been hauling the sludge to the city of Edmonds WWTP for incineration. As part of the Phase IIC improvement project, the City has completed construction of a batch-operated biosolids dryer to process the sludge in August 2005. The decant water will be routed back to the headworks, and the dried solids will be disposed of at a local landfill.

EMERGENCY BACKUP POWER

The facility has one generator located in the basement of the south side of the headworks building. This generator may be sufficient to power the influent pumps or other plant processes for a few hours during a power failure situation.

OUTFALL

After treatment and disinfection, wastewater effluent is discharged to the South Fork of the Snoqualmie River. Given the recent refinement of the COE 100-year flood elevation from 435.0 to 435.5 and the uncertainty of the condition of the diffuser manhole, conservative assumptions were made in determining the hydraulic capacity of the outfall to be approximately 5.0 mgd.

The diffusion manhole does not meet the criteria established by the Department of Ecology for wastewater effluent disposal structures. This section of the South Fork makes a slight right-hand bend, forcing the river channel over to the west bank and developing an exposed gravel bar on the east bank at low river flows. This deviation completely exposes the diffusion manhole. During low flow periods, wastewater effluent leaving the diffusion moves across the exposed gravel bar until it reaches the river channel. The Department's criteria require that effluent diffusion facilities be located in the middle of the river channel at low flow, and that no exposed discharge be permitted.

PERMIT STATUS

The previous permit for this facility was issued on November 19, 1999, and it has an expiration date of June 30, 2004. The permit was administratively extended. The previous permit placed effluent limitations on 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), pH, fecal coliform bacteria, total ammonia, total residual chlorine, copper, mercury, silver, and zinc. Through a permit modification on September 21, 2001, copper, mercury, silver, and zinc were removed, and replaced with a compliance schedule for source control and investigations. Through another permit modification on June 21, 2002, total residual chlorine effluent limitations were removed from the permit, because the chlorine disinfection system has been replaced with an ultraviolet system.

An application for permit renewal was submitted to the Department on January 20, 2004, and accepted by the Department on June 11, 2004.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection with sampling on December 6, 2004. During the history of the previous permit, the Permittee had a history of compliance problems related to metals and ammonia. The Permittee also has a history of exceeding the 85% design criteria for BOD_5. Although this exceedance is not considered to be a violation of permit conditions, it is considered to be a warning trigger that the plant may be approaching its design threshold and may require expansion. Those violations and exceedance are listed as follows:

Permit Violations		
Parameter	**Exceedance Dates**	**Type of Exceedance**
Fecal Coliform	02/01/03	Average Weekly
Copper	05 through 06/00, 09 through 11/00	Average Monthly, lb/day
	03/00 through 06/01	Average Monthly, µg/L
	04 through 06/00, 09 through 10/00, 02 through 03/01, 01/03	Maximum Daily, µg/L
Ammonia	03 through 04/00, 09/00	Average Monthly, mg/L
Silver	04/00	Average Monthly, lb/day
	04/00, 07/00, 07/01	Average Monthly, µg/L
	07/01	Maximum Daily, µg/L
Zinc	06 through 12/00, 06/01, 09/01	Average Monthly, µg/L
	09/00, 11/00	Maximum Daily, µg/L
Permit Violations for Not Reporting		
BOD_5	06/00	Maximum, lb/day, mg/L
	12/99, 01/00, 03/00, 06/00	Average Monthly, mg/L
	03/00	Average Weekly, lb/day, mg/L
Warning: Exceeded 85% Design Capacity for BOD_5, lb/day		
BOD_5	12/99, 06/00, 07/00, 08/00, 04/01, 09/01, 12/01, 01/02, 03/02, 03/02, 04/02, 04/03, 10/03, 11/03, 12/03, 01/04, 08/04	

On September 21, 2001, the discharge permit was modified to remove the metal limits. They were replaced by a compliance schedule to require source control investigation, and sampling and analysis study of the receiving water and effluent for copper and zinc using Ultra Clean Testing and Sampling techniques. On April 9, 2003, the Permittee submitted a report summarizing their findings from the studies that were conducted as required in the compliance schedule. Permittee failed to perform a Water Effect Ratio (WER) study for metals. In lieu of conducting this study, the Permittee requested approval to conduct a mixing zone study for metals. The reasons presented are as follows: 1) the cost to conduct the WER study is too great, 2) the results of WER studies performed by other wastewater treatment plants have yet to be shown to be effective or helpful, and 3) the dilution factors previously determined from the mixing zone study conducted for the previous permit was based on a river flow of 7Q20. However, the Department's *Permit Writer's Manual* and WAC 173-201A specify the use of the 7Q10 river flow value for the development of critical steady-state dilution factors. Due to these reasons, the Department has approved the City's request to conduct a mixing zone study instead of the WER study.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. A copy of the complete metals and volatile organics analysis for the effluent that was submitted with the application is attached in Appendix E. The reported concentrations for pollutants in the effluent that are regulated in this permit are as follows:

Parameter	Reported Concentration Range
BOD_5	4 – 11 mg/L
TSS	4.2 – 15 mg/L
Copper	2 – 45 µg/L
Mercury	0.4 – 1 µg/L
Silver	0.2 – 2 µg/L
Ammonia	0.03 – 11.6 mg/L

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the surface water quality standards (Chapter 173-201A WAC), ground water standards (Chapter 173-200 WAC), sediment quality standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology.

DESIGN CRITERIA

In accordance with WAC 173-220-150(1)(g), flows or waste loadings shall not exceed approved design criteria. Phases IIA and B have been completed, and Phase IIC is currently under construction, which is expected to be complete in August 2005. The remainders of Phase II improvements, which focus on the headworks, have yet to be scheduled. According to the City's consultant, Berryman Henigar, although the City has nearly completed three quarters of the improvements for Phase II, the plant's current organic loading capacity is at the proposed design criteria for the end phase of Phase II, as listed on Table 9.1 of the Engineering Report prepared by Earth Tech, dated December 1996, and approved by the Department on July 22, 1997. However, the current hydraulic capacity of the plant is not quite at the capacity proposed for the end phase of the Phase II project. It is restricted by the two influent pumps which have a capacity of 1.2 mgd each (total 2.4 mgd). Therefore, the current design criteria for the treatment facility are as follow:

Table 1: Current Design Standards for WWTP

Parameter	Design Quantity
Monthly average flow (maximum monthly)	2.4 MGD
BOD_5 influent loading (maximum monthly)	2805 lb/day
TSS influent loading (maximum monthly)	2304 lb/day

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 and in Chapter 173-221 WAC (state). These regulations include performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD_5, and TSS, taken from Chapter 173-221 WAC, are:

Table 2: Technology-based Limits

Parameter	Limit
pH	shall be within the range of 6.0 to 9.0 standard units
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
$CBOD_5$ (concentration)	Average Monthly Limit is the most stringent of the following: - 25 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 40 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The $CBOD_5$ limits shown above are used in place of BOD_5 limits, according to WAC 173-221-050(6).

The technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

<u>These $CBOD_5$ limits will apply during the months of November through July</u>:

> Monthly effluent mass loadings (lb/day) were calculated as the maximum monthly design flow (2.4 MGD) x Concentration limit (25 mg/L) x 8.34 (conversion factor) = mass limit 500 lb/day $CBOD_5$.
>
> The weekly average effluent mass loadings (lb/day) were calculated as the maximum monthly design flow (2.4 MGD) x Concentration limit (40 mg/L) x 8.34 (conversion factor) = mass limit 801 lb/day $CBOD_5$.

<u>$CBOD_5$ mass limits for the months of August through October are determined by the TMDL allocations</u>. <u>$CBOD_5$ concentration limits for the months of July through October are the technology-based limits shown above</u>. The technology-based concentration limits are to be considered an upper bound; actual effluent concentrations will need to be lower in order to comply with the TMDL-based mass limits.

<u>These TSS limits will apply during the months of November through July</u>:

> Monthly effluent mass loadings (lb/day) were calculated as the maximum monthly design flow (2.4 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 600 lb/day TSS.
>
> The weekly average effluent mass loadings (lb/day) were calculated as the maximum monthly design flow (2.4 MGD) x Concentration limit (45 mg/L) x 8.34 (conversion factor) = mass limit 901 lb/day TSS.

These TSS limits will apply during the months of August through October:

Monthly effluent TSS mass loading (lb/day) is calculated as the dry weather design flow (1.17 MGD) x concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 293 lb/day.

Weekly effluent TSS mass loading (lb/day) is calculated as the maximum monthly design flow (1.17 MGD) x concentration limit (45 mg/L) x 8.34 (conversion factor) = mass limit 439 lb/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established surface water quality standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

On July 3, 1996, the Snoqualmie River TMDL was approved by the Environmental Protection Agency. The TMDL study addresses the critical condition, which in this case occurs during the summer low flow period of August through October. This TMDL limits ammonia, nitrogen, fecal coliform bacteria, and $CBOD_5$ in the South Fork of the Snoqualmie River in the vicinity of the North Bend WWTP and downstream through the mainstem Snoqualmie to its confluence with the Skykomish River.

The TMDL contained an evaluation of two options, one for the three existing municipal WWTPs, and one for five municipal WWTPs, which included the two potential discharges of Fall City and Carnation. The TMDL water quality-based limits set forth in the previous permit utilized the option with only three municipal discharges in the river system. Under that scenario, the TMDL provides an allocation of 175 lb/day of $CBOD_5$ and 81.5 lb/day of ammonia to the City of North Bend, based on Phase II expanded loadings. Utilizing the Qual2E model and rerunning it to determine the "equivalency" between BOD and ammonia in producing downstream dissolved oxygen impacts, it was found that 2.155 lb of $CBOD_5$ loading is equivalent to 1 lb of ammonia loading from the North Bend WWTP. Using the 2.155:1 $CBOD_5$/ammonia exchange ratio, the $CBOD_5$ and ammonia limits were determined to be 307 lb/day and 20.25 lb/day, respectively, in the previous permit. These limits will remain unchanged in this renewed permit until the city of Carnation WWTP is ready to begin its operation.

It is expected that the city of Carnation's new WWTP will be in operation in late 2007 or early 2008. When the city of Carnation WWTP comes on line, the TMDL waste load allocation (WLA) established for the City of North Bend under the five-WWTP scenario will become effective. In the five-plant scenario, the TMDL study provides a WLA for $CBOD_5$ of 175 lb/day and 58.2 lb/day for ammonia to the City of North Bend, based on Phase II expanded loadings. Utilizing the 2.155:1 CBOD/ammonia ratio as established above, and holding the same ammonia limit of 20.25 lb/day, the new WLA for $CBOD_5$ is determined to be 257 lb/day.

Equivalent BOD_5 loading is defined by the following equations:

Equivalent $CBOD_5 = CBOD_{5(TMDL)} + NBOD_{5(or\ Ammonia\ TMDL\ times\ R)}$
Where: R is the exchange ratio between $CBOD_5$ and ammonia loading for the North Bend WWTP.

Previous permit limit for $CBOD_5$ under the 3-plant scenario:
Equivalent $CBOD_5$ = 307 lb/day
307 + R (20.25) = 175 + R 81.5
R= 2.155 (as discussed above)

$CBOD_5$ limit for the 5-plant scenario (holding ammonia limit at 20.25 lb/day):
Equivalent $CBOD_5$ + 2.155 (20.25) = 175 + 2.155 (58.2)
Equivalent $CBOD_5$ = **257 lb/day**

Scenario	**TMDL WLA for $CBOD_5$, lb/day**	**TMDL WLA for Ammonia, lb/day**
3-plant w/o $CBOD_5$-NH_3 substitution	175	81.5
5-plant w/o $CBOD_5$-NH_3 substitution	175	58.2
Effluent Limits	**Equivalent $CBOD_5$, lb/day**	**Equivalent Ammonia, lb/day**
Previous Permit Limits: 3-plant w/ $CBOD_5$-NH_3 substitution	307	20.25
5-plant w/ $CBOD_5$-NH_3 substitution	257	20.25

Compliance with the technology-based standards for fecal coliform will meet the requirements of the TMDL.

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the water quality standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic waterbody uses.

MIXING ZONES

The water quality standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the South Fork of the Snoqualmie River which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls include the city of Snoqualmie, located downstream in the main stem of the Snoqualmie River. Significant nearby non-point sources of pollutants include silvicultural activities in the upper reaches and agricultural activities down river. Characteristic uses include the following:

> water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum; when natural conditions exceed 18 degrees no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 degrees C.
pH	6.5 to 8.5 standard units with a human-caused variation within a range of less than 0.5 units.
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the flow limitations in WAC 173-201A. The City submitted a mixing zone study to the Department on November 5, 2004, which was amended on March 23, 2005. The study was approved on May 16, 2005. The study contained an evaluation of the validity of the previously determined dilution factors which used the 7Q20 river flow values for evaluating steady-state conditions. The *Permit Writer's Manual* and the state regulations specify the use of the 7Q10 low-flow value for evaluating steady-state conditions. Thus, the mixing study was conducted using the 7Q10 river flow. Using the effluent concentrations between January 2001 and December 2004 and the recently collected ambient data in the receiving water, the RIVPLUM model was run using 7Q10 and percentage of river flow calculation. The study yielded the following steady-state dilution factors for the wastewater treatment plant: Acute dilution factor of 3.25 and chronic dilution factor of 22.4.

However, the chronic dilution factor exceeds the maximum chronic dilution factor of 18.7 as allowed under WAC 173-201A. The allowable maximum width of the plume at the edge of the mixing zone is 25% of the width of river, which is (0.25 x 51.5, width of river) 12.9 feet. Correlating the dilution factor and width of the plume at various distances from the outfall as depicted in Figure 4 below, the maximum size of the mixing zone to keep the width of the plume at 12.9 feet, is 175 feet. The chronic dilution factor at this location is 18.7.

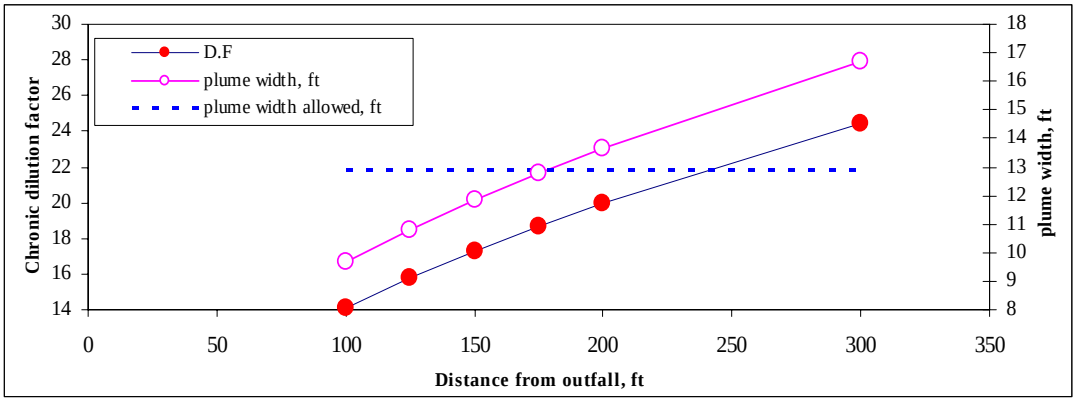

Figure 4: Chronic dilution factor and plume width as a function of distance from the outfall.

Therefore, the Department proposes an acute dilution factor of 3.25 and a chronic dilution factor of 18.7 in this permit.

Comparison of Dilution Factors With the Previous Permit Issued 11-19-99

Low Flow (Aug-Oct)	**Acute**	**Chronic**
Proposed dilution factors (DF)	3.25	18.7
Previous permit DF	1.5	10.1

Table 3: Ambient Data Used in the Mixing Zone Study (some of these data were collected by the City and some were taken from the TMDL study)

Parameter	**Value Used**
7Q10 low flow	85 cfs
Temperature	18.1^{o} C
pH (high)	7.9
Dissolved Oxygen	9.5 mg/L
Total Ammonia as N	0.012 mg/L
Hardness	35 mg/L as $CaCO_3$
Copper	0.74 µg/L (dissolved)
Zinc	0.5 µg/L (total recoverable estimated value equal to dissolved value)
All Other Metals	0.0 (below detection limits)

Table 4: Critical Steady-State WWTP Effluent Flow Rates for the Low Flow Condition – Used in the Mixing Zone Study

Condition	Acute (mgd)	Chronic (mgd)
Critical WWTP Effluent Flow From DMRs (January 2001 through November 2004)	0.61	0.47

If effluent flows increase significantly during the course of this permit cycle, the dilution factors will need to be reevaluated. This is because the dilution factors are expected to be decreased as the plant flows increase.

BOD_5—Under critical conditions there was a prediction of a potential to violate the dissolved oxygen criterion for the receiving water with the $CBOD_5$ discharge limitation set at the technology-based limitation and the ammonia discharge levels which have been observed following the Phase II plant expansion. The TMDL-based limit determined for $CBOD_5$ of 307 lb/day daily maximum along with the effluent limit for ammonia of 20.25 lb/day daily maximum were found to be protective of the dissolved oxygen criterion for the Phase II WWTP. These limits will remain in this permit until the city of Carnation WWTP is ready to begin its operation. When the city of Carnation WWTP comes online, the new $CBOD_5$ limit will be set at 257 lb/day and the ammonia limit will remain at 20.25 lb/day (see page 12 for more discussion). Monthly average limits calculated from the above TMDL-based daily maximum limits using methods from EPA, 1991, are shown on Table 3 of Appendix C. The TMDL limits apply during the low river flow season of July through October.

Temperature and pH—Under critical conditions there is no reasonable potential to violate the water quality standards for surface waters. Therefore, the technology-based effluent limitations for pH were placed in the permit, and no limitation for temperature was placed in the permit.

Fecal Coliform—The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml.

Under critical conditions there is no reasonable potential to violate the water quality standards for surface waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the water quality standards for surface waters or from having surface water quality standard-based effluent limits.

During the preparation of the previous permit, ammonia, copper, mercury, silver, and zinc were determined to have reasonable potential to exceed water quality standards at the critical condition, and effluent limits for these parameters were established in the permit. A reasonable potential analysis (see Appendix C) was conducted again on these parameters using the data generated during the previous permit term (between November 1999 and December 2004). The analysis indicated that only mercury has a reasonable potential to exceed the water quality standard. Thus, the following water quality-based effluent limit was determined for mercury: 0.2 µg/L as average

monthly limitation, and 0.4 µg/L as maximum daily limitation (expressed in total recoverable values), using the new dilution factors as discussed on page 17 of this fact sheet. Effluent limits were calculated using methods from EPA, 1991, as shown in Appendix C.

Due to the fact that the reasonable potential calculation indicated that there is no reasonable potential to exceed the water quality criteria at the critical condition for ammonia, no effluent limits for ammonia are set for the high flow period. However, the TMDL restricts ammonia during the low flow period (August through October) to a maximum daily limit of 20.25 lb/day. This TMDL limit was set in the previous permit and will remain the same in this permit. The average monthly limit was then calculated from the TMDL daily maximum limit for ammonia using the procedure given in "*EPA-Technical Support Document for Water Quality-based Toxics Control*," March 1991. The calculation yields an average monthly limit of 8.4 lb/day for ammonia, which is detailed on page 34, in Table 3 of Appendix C.

The determination of the reasonable potential for ammonia and heavy metals to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C, Table 1) at the critical condition. The critical condition in this case occurs during the summer low flow period of August through October.

The parameters used in the critical condition modeling are as follows: an acute dilution factor of 3.25, a chronic dilution factor of 18.7, a receiving water temperature of 18.1^{o} C, a receiving water hardness of 35 mg/L (as $CaCO_3$), an ammonia-nitrogen concentration of 12 µg/L, copper concentration of 0.74 µg/L, and zinc concentration of 0.5 µg/L. No ambient data was available for mercury and silver, and zero was used as the background concentration for these pollutants in the reasonable potential calculation.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

In accordance with WAC 173-205-040, the Permittee's effluent may have the potential to contain toxic chemicals. The proposed permit would ordinarily contain requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC.

The Permittee was required in the previous permit to conduct two acute and two chronic toxicity testings in 2003, as an effluent characterization. The Permittee conducted test in October of 2003. The October results show no toxicity but are not enough by themselves to fulfill the permit requirements. Therefore, this permit requires the facility to repeat the toxicity testing, one set of acute and chronic testing in the summer and in the winter of 2009. The requirements are listed in S8 and S9 of the permit.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

Based upon the results of the toxicity testing as mentioned above, the facility may be required to evaluate the discharge for impacts to human health during the next permit cycle.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated ground water quality standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED 11-19-99, Modified 09-21-01 and 06-21-02

Low River Flow Period (August, September, and October)

	PREVIOUS EFFLUENT LIMITATIONS: OUTFALL # 001		**PROPOSED EFFLUENT LIMITATIONS: OUTFALL # 001**		**PROPOSED EFFLUENT LIMITATIONS AFTER CARNATION COMES ON LINE: OUTFALL # 001**	
Parameter	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
Carbonaceous Biochemical Oxygen Demand (5-day)	25 mg/L, (192 lb/day)	40 mg/L, (307 lb/day) TMDL Limit	25 mg/L	40 mg/L	25 mg/L	40 mg/L
Total Suspended Solids	30 mg/L, (230 lb/day)	45 mg/L, (345 lb/day)	30 mg/L, (293 lb/day)[1]	45 mg/L, (439 lb/day)[1]	30 mg/L, (293 lb/day)[1]	45 mg/L, (439 lb/day)[1]
Fecal Coliform Bacteria	200/100 mL	400/100 mL	200/100 mL	400/100 mL	200/100 mL	400/100 mL
pH	shall not be outside the range of 6.0 to 9.0		shall not be outside the range of 6.0 to 9.0		shall not be outside the range of 6.0 to 9.0	
Parameter	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Carbonaceous Biochemical Oxygen Demand (5-day)			179[3] lb/day TMDL Limit	307[2] lb/day TMDL Limit	150[3] lb/day TMDL Limit	257[2] lb/day TMDL Limit
Ammonia NH_3-N	0.8 mg/L (6 lb/day) TMDL Limit	(20.25 lb/day) TMDL Limit	8.4[3] lb/day TMDL Limit	20.25 lb/day TMDL Limit	8.4[3] lb/day TMDL Limit	20.25 lb/day TMDL Limit
Mercury (TR)[4]	0.1 µg/L, (0.0007 lb/day)	0.2 µg/L	0.2 µg/L	0.4 µg/L	0.2 µg/L	0.4 µg/L
Copper (TR)[4]	3.5 µg/L, (0.26 lb/day)	9.5 µg/L	Monitor only	Monitor only	Monitor only	Monitor only
Silver (TR)[4]	0.2 µg/L, (0.002 lb/day)	1.0 µg/L	Monitor only	Monitor only	Monitor only	Monitor only
Zinc (TR)[4]	43.7 µg/L, (0.34 lb/day)	67.8 µg/L	Monitor only	Monitor only	Monitor only	Monitor only

[1] The mass-based limits for the low flow period are calculated using the Monthly Average Dry Weather flow of 1.17 MGD.

[2] The TMDL limits discussion are presented under the Surface Water Quality-based Effluent Limitations section on page 14 of the fact sheet.

[3] Monthly average limits calculated from the above TMDL-based daily maximum limits using methods from EPA, 1991, are shown on Table 3 of Appendix C.

[4] TR means total recoverable.

High River Flow Period (November through July)

	PREVIOUS EFFLUENT LIMITATIONS: OUTFALL # 001		**PROPOSED EFFLUENT LIMITATIONS: OUTFALL # 001**		**PROPOSED EFFLUENT LIMITATIONS AFTER CARNATION COMES ON LINE: OUTFALL # 001**	
Parameter	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**	**Average Monthly**	**Average Weekly**
Carbonaceous Biochemical Oxygen Demand (5-day)	25 mg/L, (221 lb/day)	40 mg/L, (354 lb/day)	25 mg/L, (500 lb/day)[1]	40 mg/L, (801 lb/day)[1]	25 mg/L, (500 lb/day)[1]	40 mg/L, (801 lb/day)[1]
Total Suspended Solids	30 mg/L, (265 lb/day)	45 mg/L, (398 lb/day)	30 mg/L, (600 lb/day)[1]	45 mg/L, (901 lb/day)[1]	30 mg/L, (600 lb/day)[1]	45 mg/L, (901 lb/day)[1]
Fecal Coliform Bacteria	200/100 mL	400/100 mL	200/100 mL	400/100 mL	200/100 mL	400/100 mL
pH	shall not be outside the range of 6.0 to 9.0		shall not be outside the range of 6.0 to 9.0		shall not be outside the range of 6.0 to 9.0	
Parameter	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
Ammonia NH_3-N	7.1 mg/L	15.4 mg/L	Monitor only[2]	Monitor only[2]	Monitor only[2]	Monitor only[2]
Mercury (TR)[4]	0.1 µg/L	0.2 µg/L	0.2[3] µg/L	0.4[3] µg/L	0.2[3] µg/L	0.4[3] µg/L
Silver (TR)[4]	0.2 µg/L	1.0 µg/L	Monitor only[2]	Monitor only[2]	Monitor only[2]	Monitor only[2]

[1] The mass-based limits for the high flow period are calculated using the design flow of 2.4 MGD (Table 1, page 12 of the fact sheet) for the maximum high flow month.

[2] No limitation is set because there is no reasonable potential to exceed water quality criteria (see Table 1 of Appendix C, and discussion under the Surface Water Quality Criteria section on page 19 of the fact sheet).

[3] See Table 2 of Appendix C, permit limit calculation.

[4] TR means total recoverable.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for phosphorous is being required to further characterize the effluent. This pollutant could have an impact on the quality of the surface water, in particular, the enhancement of nuisance growths in the vicinity of the outfall.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for oxidation ditches.

EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limit for mercury in the waste water is below the capability of current analytical technology to quantify. The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee is authorized to report NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

EFFLUENT LIMITS BELOW DETECTION

The average monthly water quality-based effluent limit for mercury in the waste water is below the capability of current analytical technology to detect. The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that its concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

LAB ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for general chemistry and microbiology. Metals analysis and ammonia analysis are done at an accredited contract laboratory.

OTHER PERMIT CONDITIONS

REPORTING AND RECORD KEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S4 restricts the amount of flow during the two flow periods.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems, the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state water quality standards.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program [i.e., act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]**.** Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g., tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)] (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty (60) days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g., tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires nondelegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State Waste Discharge Permit application.

WHOLE EFFLUENT TOXICITY CHARACTERIZATION

The Permittee will be required to characterize the discharge for whole effluent toxicity as a part of the permit renewal process. All municipal discharges greater than one MGD are required by regulation to include whole effluent toxicity characterization as a part of their permit renewal application.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels

stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Conditions G7 relates to permit renewal. Condition G8 prohibits the reintroduction of removed substances back into the effluent. Condition G9 states that the Department will modify or revoke and reissue the permit to conform to more stringent toxic effluent standards or prohibitions. Condition G10 incorporates by reference all other requirements of 40 CFR 122.41 and 122.42. Condition G11 notifies the Permittee that additional monitoring requirements may be established by the Department. Condition G12 requires the payment of permit fees. Condition G13 describes the penalties for violating permit conditions.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary, to meet water quality standards, sediment quality standards, or ground water standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued to expire April 4, 2011.

REFERENCES FOR TEXT AND APPENDICES

City of North Bend

2004. Permit Application EPA Form 2A.

2001. Final Comprehensive Sewer Plan.

Engineering Report.

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1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-Based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

TMDL, Joy J.

1994. Snoqualmie River Total Maximum Daily Load Study. Ecology Report No. 94-71. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, Washington.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

2004. Permit Writer's Manual. Publication Number 92-109

1996. Total Maximum Daily Load Development Guidelines. Publication 97-315.

APPENDIX A—PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Application (PNOA) was published on June 16, 2004, and June 23, 2004, in the *Snoqualmie Valley Record* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on December 1, 2005, in the *Snoqualmie Valley Record* to inform the public that a draft permit and fact sheet were available for review. Interested persons were invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents were available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments were mailed to:

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008-5452

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30)-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (425) 649-7201, or by writing to the address listed above.

This permit and fact sheet were written by Jeanne Tran, P.E.

APPENDIX B—GLOSSARY

Acute Toxicity—The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART—An acronym for "all known, available, and reasonable methods of treatment."

Ambient Water Quality—The existing environmental condition of the water in a receiving water body.

Ammonia—Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation—The average of the measured values obtained over a calendar month's time.

Average Weekly Discharge Limitation—The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)—Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5—Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass—The intentional diversion of waste streams from any portion of a treatment facility.

$CBOD_5$—The five-day measure of the pollutant parameter carbonaceous biochemical oxygen demand. The test measures the molecular oxygen utilized for the biochemical degradation of organic material (carbonaceous demand). Nitrogenous demand is excluded from the measurement by addition of an inhibitor to the sample.

Chlorine—Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity—The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)—The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)—The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling—A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling—A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample—A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity—Clearing, grading, excavation, and any other activity which disturbs the surface of the land. Such activities may include road building; construction of residential houses, office buildings, or industrial buildings; and demolition activity.

Critical Condition—The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor—A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction, e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report—A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria—Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample—A single sample or measurement taken at a specific time or over as short a period of time as is feasible.

Industrial User—A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater—Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)—"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of rainfall-caused surface water drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference—A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) [including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA], sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility—A facility discharging to surface water with an EPA rating score of >80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation—The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)—The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility—A facility discharging to surface water with an EPA rating score of <80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone—An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)—The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

Pass Through—A discharge which exits the POTW into waters of the state in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of state water quality standards.

pH—The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)—A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)—

1) All industrial users subject to categorical pretreatment standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement [in accordance with 40 CFR 403.8(f)(6)].

   Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

   *The term "Control Authority" refers to the Washington State Department of Ecology in the case of nondelegated POTWs or to the POTW in the case of delegated POTWs.

State Waters—Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater—That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit—A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)—Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit—A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C—TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State Water Quality Standards can be found on the Department's homepage at
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html)

Table 1.
Calculation of Reasonable Potential to Exceed Water Quality Criteria

Prepared by Department of Ecology, 4/21/2005 NPDES Permit No. 002935-1

Parameter	Metal Criteria Translator as decimal Acute	Metal Criteria Translator as decimal Chronic	Ambient Concentration (metals as dissolved) ug/L	Acute ug/L	Chronic ug/L	Acute Mixing Zone ug/L	Chronic Mixing Zone ug/L	LIMIT REQ'D?	Effluent percentile value	Pn	Max effluent conc. measured (metals as total recoverable) ug/L	Coeff Variation CV	s	# of samples n	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	COMMENTS
ammonia			12.00	6700	1240	5194.26	912.66	NO	0.95	0.905	14000	0.60	0.55	30	1.20	3.25	18.7	Critical condition: low flow peirod
copper	1.00	1.00	0.740	7.527	4.744	6.01	1.66	NO	0.95	0.950	18.00	0.79	0.70	59	1.00	3.25	18.7	Use data from 2001 to 2004
mercury	0.85	0.85		2.100	0.0120	0.22	0.039	YES	0.95	0.950	0.85	0.60	0.55	59	1.00	3.25	18.7	Allowed 95% value to be used
silver	0.85	0.85		0.778	1000	0.27	0.047	NO	0.95	0.950	1.04	1.24	0.96	59	1.00	3.25	18.7	instead of max. effl conc.
zinc	1.00	1.00	0.500	54.96	44.00	24.82	4.73	NO	0.95	0.950	80.00	0.44	0.42	59	1.00	3.25	18.7	because > 20 data points (PWM)

Table 2.
Permit Limit Calculation for Listed Pollutants

4/21/2005 2:50 PM
TSDC10-12-17-02 (updated values from cosmopolitan) diff CV-3-23-05.xls NPDES PERMIT # WA-002935-1

Dilution (Dil'n) factor is the inverse of the percent effluent concentration at the edge of the acute or chronic mixing zone.

Permit Limit Calculation Summary; Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations; Statistical variables for permit limit calculation

PARAMETER	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator Acute	Metal Criteria Translator Chronic	Ambient Concentration ug/L	Water Quality Standard Acute ug/L	Water Quality Standard Chronic ug/L	Average Monthly Limit (AML) ug/L	Maximum Daily Limit (MDL) ug/L	Comments	WLA Acute ug/L	WLA Chronic ug/L	LTA Acute ug/L	LTA Chronic ug/L	LTA Coeff. Var. (CV) decimal	LTA Prob'y Basis decimal	Limiting LTA ug/L	Coeff. Var. (CV) decimal	AML Prob'y Basis decimal	MDL Prob'y Basis decimal	# of Samples per Month n	
ammonia	3.25	18.70			12.000	6700.00	1240.0000	10840	21748.0		21748	22975.6	6983	12118	0.60	0.99	6982.9	0.60	0.95	0.99	4.00	1.00
mercury	3.25	18.70	0.85	0.85		2.10	0.012	0.2	0.4		7	0.22	2.2	0.1	0.60	0.99	0.1	0.60	0.95	0.99	4.00	0.85

Table 3: Calculation of Low Flow TMDL Water Quality-based Effluent Limits

Using the procedure given in "*EPA-Technical Support Document for Water Quality-based Toxics Control,*" March 1991.

1. The Daily Waste Load Allocation (WLA)=Maximum Daily Limit=MDL
2. Calculate the long term average (LTA) which will comply with this wasteload allocation

$$MDL = LTAx\, e^{(Z\sigma - 0.5\sigma^2)}$$

where:

σ = Standard Deviation
z = 2.326 (99th percentile occurrence)
CV = coefficient of variation = std. dev./mean
LTA = long term average

3. Calculate the monthly average effluent limit

$$AML = LTAx\, e^{(Z\sigma_n - 0.5\sigma_n^2)}$$

where:

AML=Average Monthly Limit

Calculating Average Monthly Limit for CBOD5 Based on Wasteload Allocation for 3-plant scenario
Source: EPA Technical Support Document for Water Quality-based Toxics Control

Input	Definition	Formula	Result	Units	Parameter
MDL	Maximum Daily Limit	=Daily WLA	**307**	lb/day	CBOD
CV	Coefficient of Variation	Calc. std. dev/mean	0.35		DMR data, Aug-Oct 2000-2004, monthly average
n	Number of samples	per month	8		
Variables					
σ	Standard Deviation	$\text{sqrt}\{\ln(CV^2+1)\}$	0.340		
σ^2	Standard Deviation, squared	$\ln(CV^2+1)$	0.116		
σ_n		$\ln(CV/n+1)$	0.123		
σ^2_n		$\ln(CV^2/n+1)$	0.015		
z (99th)	99th Percentile Occurrence		2.326		
z (95th)	95th Percentile Occurrence		1.645		
Output					
LTAc	Chronic Long-term average	$MDL*\exp(z_{99}\sigma-0.5\sigma^2)$	147.5	lb/day	CBOD
AML	Average Monthly Limit	$LTAc*\exp(z_{95}\sigma_n-0.5\sigma_n^2)$	**179.3**	lb/day	CBOD

Calculating Average Monthly Limit for CBOD5 Based on Wasteload Allocation for 5-plant scenario
Source: EPA Technical Support Document for Water Quality-based Toxics Control

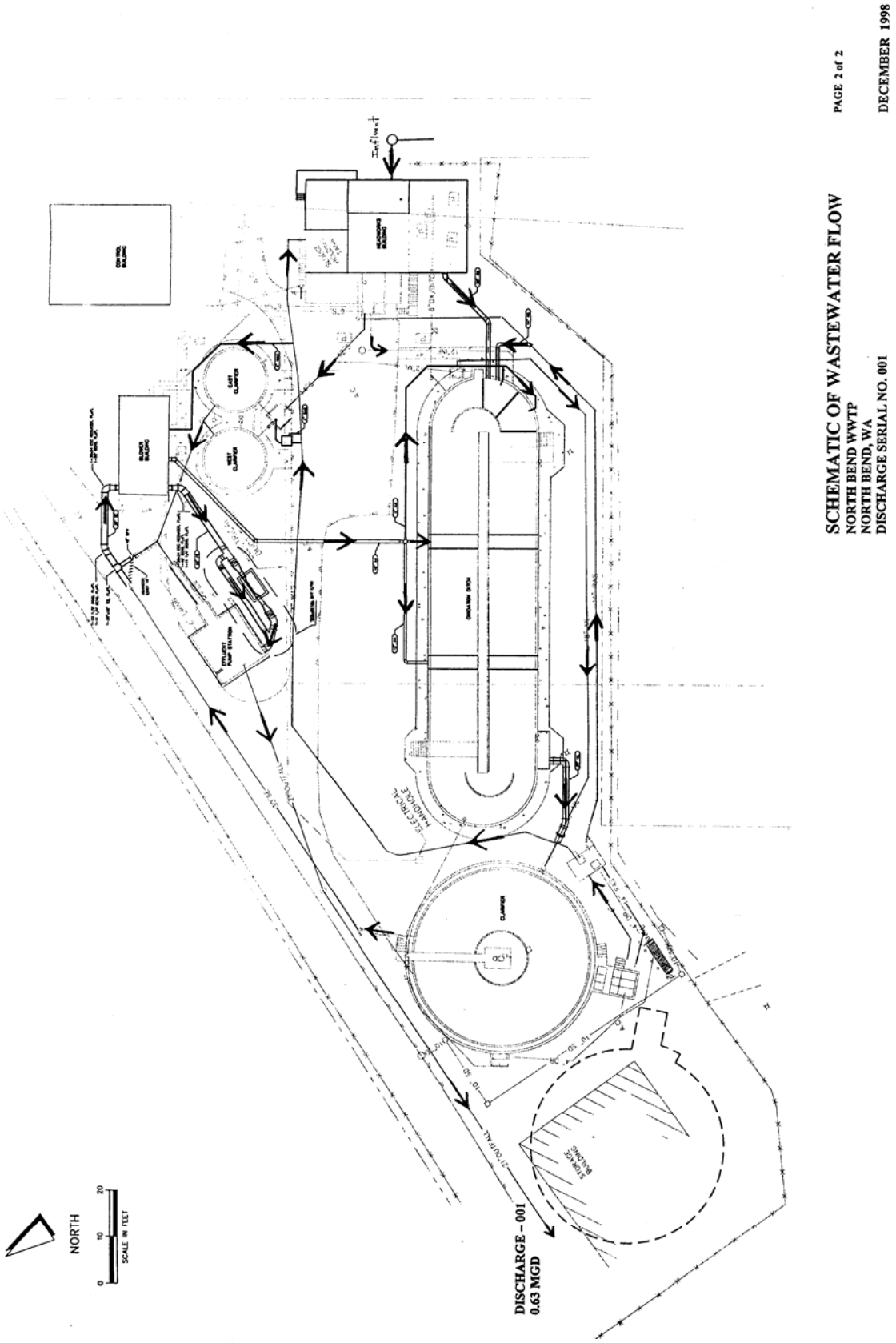
Input	Definition	Formula	Result	Units	Parameter
MDL	Maximum Daily Limit	=Daily WLA	**257**	lb/day	CBOD
CV	Coefficient of Variation	Calc. std. dev/mean	0.35		DMR data, Aug-Oct 2000-2004, monthly average
n	Number of samples	per month	8		
Variables					
σ	Standard Deviation	$\text{sqrt}\{\ln(CV^2+1)\}$	0.340		
σ^2	Standard Deviation, squared	$\ln(CV^2+1)$	0.116		
σ_n		$\ln(CV/n+1)$	0.123		
σ^2_n		$\ln(CV^2/n+1)$	0.015		
z (99th)	99th Percentile Occurrence		2.326		
z (95th)	95th Percentile Occurrence		1.645		
Output					
LTAc	Chronic Long-term average	$MDL*\exp(z_{99}\sigma-0.5\sigma^2)$	123.5	lb/day	CBOD
AML	Average Monthly Limit	$LTAc*\exp(z_{95}\sigma_n-0.5\sigma_n^2)$	**150.1**	lb/day	CBOD

Calculating Average Monthly Limit for Ammonia Based on Wasteload Allocation
Source: EPA Technical Support Document for Water Quality-based Toxics Control

Input	Definition	Formula	Result	Units	Parameter
MDL	Maximum Daily Limit	=Daily WLA	**20.25**	lb/day	Ammonia
CV	Coefficient of Variation	Calc. std. dev/mean	0.91		DMR data, Aug-Oct 2000-2004, monthly average
n	Number of samples	per month	4		
Variables					
σ	Standard Deviation	$\text{sqrt}\{\ln(CV^2+1)\}$	0.777		
σ^2	Standard Deviation	$\ln(CV^2+1)$	0.603		
σ_n		$\ln(CV/n+1)$	0.434		
σ^2_n		$\ln(CV^2/n+1)$	0.188		
z (99th)	99th Percentile Occurrence		2.326		
z (95th)	95th Percentile Occurrence		1.645		
Output					
LTAc	Chronic Long-term average	$MDL*\exp(z_{99}\sigma-0.5\sigma^2)$	4.5	lb/day	Ammonia
AML	Average Monthly Limit	$LTAc*\exp(z_{95}\sigma_n-0.5\sigma_n^2)$	**8.4**	lb/day	Ammonia

TMDL Months (August, September, October)				
Dates	NITROGEN, A AVG MG/L	Flow MGD	Cal NH4 AVG LBS/DAY	CBOD5 AVG LBS/DAY
1-Aug-00	0.2	0.47	0.78396	21
1-Sep-00	1.2	0.4	4.0032	26
1-Oct-00	0.02	0.4	0.06672	13
1-Aug-01	0.4	0.44	1.46784	23
1-Sep-01	0.4	0.41	1.36776	17
1-Oct-01	0.3	0.45	1.1259	13
1-Aug-02	0.26	0.41	0.889044	13
1-Sep-02	0.5	0.37	1.5429	15
1-Oct-02	0.1	0.32	0.26688	9
1-Aug-03	0.1	0.37	0.30858	10
1-Sep-03	0.3	0.4	1.0008	9
1-Oct-03	0.3	0.5	1.251	18
1-Aug-04	0.14	0.47	0.548772	13
1-Sep-04	0.07	0.47	0.274386	12
1-Oct-04	0.2	0.41	0.68388	10
Average			1.038775	14.8
Stan Dev			0.944909	5.212622
CV			0.909638	0.352204

APPENDIX D—TREATMENT PLANT PROCESS FLOW DIAGRAM



APPENDIX E—VOLATILE ORGANICS AND METALS DATA

The following analytical data was submitted to the Department on January 20, 2004. The sampling was conducted by AMTEST Laboratory in November 2003 and reported to the City of North Bend in January 2004.

Parameter	Results	Units
Conventionals		
Total Cyanide	< 0.0050	mg/l
Hardness	55.0000	mg/l
Total Phenol	< 0.0050	mg/l
Total Metals		
Antimony	< 0.0100	mg/l
Arsenic	0.0010	mg/l
Beryllium	< 0.0005	mg/l
Calcium	19.0000	mg/l
Cadmium	< 0.0005	mg/l
Chromium	< 0.0010	mg/l
Copper	0.02000	mg/l
Mercury	< 0.0002	mg/l
Magnesium	2.0000	mg/l
Nickel	< 0.0050	mg/l
Lead	< 0.0010	mg/l
Selenium	<0.0010	mg/l
Silver	< 0.0100	mg/l
Thallium	< 0.0010	mg/l
Zinc	0.0370	mg/l
Volatile Organic Compounds (EPA 624)		
Chloromethane	< 5.0	µg/l
Vinyl Chloride	< 5.0	µg/l
Bromomethane	< 5.0	µg/l
Chloroethane	< 5.0	µg/l
Trichlorofluoromethane	< 1.0	µg/l
1,1-Dichloroethylene	< 1.0	µg/l
Acetone	<20.00	µg/l
Carbon Disulfide	< 1.0	µg/l
Methylene Chloride	< 1.5	µg/l
1,2-Dichlorethylene	< 1.0	µg/l
1,1-Dichloroethane	< 1.0	µg/l
2-Chloro Vinyl Ether	<10.0	µg/l
2-Butanone (MEK)	< 5.0	µg/l
Chloroform	< 1.0	µg/l

Parameter	Results	Units
1,1,1-Trichloroethane	< 1.0	µg/l
Carbon Tetrachloride	< 1.0	µg/l
Benzene	< 1.0	µg/l
1,2-Dichloroethane	< 1.0	µg/l
1,1,2-Trichloroethylene	< 1.0	µg/l
Bromodichloromethane	< 1.0	µg/l
1,2-Dichloropropane	< 1.0	µg/l
4-Methyl-2-Pentanone MIBK	<10.0	µg/l
Toluene	< 1.0	µg/l
Cis-1,3-Dichloropropene	< 1.0	µg/l
1,1,2-Trichloroethane	< 1.0	µg/l
Tetrachloroethylene	< 1.0	µg/l
2-Hexanone	< 5.0	µg/l
Chlorodibromomethane	< 1.0	µg/l
Chlorobenzene	< 1.0	µg/l
Ethyl Benzene	< 1.0	µg/l
Total Xylenes	< 1.0	µg/l
Styrene	< 1.0	µg/l
Bromoform	< 1.0	µg/l
1,1,2,2-Tetrachloroethane	< 1.0	µg/l
Trans-1,3-Dichloropropene	< 1.0	µg/l
p-Dichlorobenzene	< 1.0	µg/l
Surrogate (% recovery)		
D4-1,2-Dichloroethane	108.0	
D8-Toluene	98.2	
4-Bromofluorobenzene	92.9	
Semi-Volatile Organics (EPA 625)		
N-Nitrosodimethylamine	< 5.1	µg/l
Aniline	< 2.0	µg/l
Phenol	< 2.0	µg/l
bis (2-Chloroethyl) ether	< 2.0	µg/l
2-Chlorophenol	< 2.0	µg/l
1,3-Dichlorobenzene	< 2.0	µg/l
1,4-Dichlorobenzene	< 2.0	µg/l
Benzyl Alcohol	< 2.0	µg/l
1,2-Dichlorobenzene	< 2.0	µg/l
2-Methylphenol	< 2.0	µg/l
bis (2-Chloroisopropyl) ether	< 2.0	µg/l
4-Methylphenol	< 2.0	µg/l
N-Nitroso-di-n-propylamine	< 2.0	µg/l
Hexachloroetheane	< 2.0	µg/l
Nitrobenzene	< 2.0	µg/l
Isophorone	< 2.0	µg/l

Parameter	Results	Units
2-Nitrophenol	< 5.1	µg/l
2,4-Dimethylphenol	< 2.0	µg/l
Benzoic Acid	< 5.1	µg/l
bis (2-Chloroethoxy) methane	< 2.0	µg/l
2,4-Dichlorophenol	< 2.0	µg/l
1,2,4-Trichlorobenzene	< 2.0	µg/l
Naphthalene	< 2.0	µg/l
4-Chloroaniline	< 2.0	µg/l
Hexachlorobutadiene	< 2.0	µg/l
4-Chloro-3-methylphenol	< 2.0	µg/l
2-Methylnaphthalene	< 2.0	µg/l
Hexachlorocyclopentadiene	< 5.1	µg/l
2,4,6-Trichlorophenol	< 2.0	µg/l
2,4,5-Trichlorophenol	< 2.0	µg/l
2-Chloronaphthalene	< 2.0	µg/l
2-Nitroaniline	< 5.1	µg/l
Dimethythylphthalate	< 2.0	µg/l
Acenaphthylene	< 2.0	µg/l
2,6-Dinitrotoluene	< 5.1	µg/l
3-Nitroaniline	< 5.1	µg/l
Acenaphthene	< 2.0	µg/l
2,4-Dinitrophenol	<10.0	µg/l
4-Nitrophenol	<10.0	µg/l
Dibenzofuran	< 2.0	µg/l
2,4-Dinitrotoluene	< 5.1	µg/l
Diethylphthalate	< 2.0	µg/l
4-Chlorophenyl-phenyl ether	< 2.0	µg/l
Fluorene	< 2.0	µg/l
4-Nitroaniline	< 5.1	µg/l
4,6-Dinitro-2-methylphenol	< 5.1	µg/l
N-nitrosodiphenylamine	< 2.0	µg/l
Azobenzene	< 2.0	µg/l
4-Bromophenyl-phenyl ether	< 2.0	µg/l
Hexachlorobenzene	< 2.0	µg/l
Pentachlorophenol	< 5.1	µg/l
Phenanthrene	< 2.0	µg/l
Anthracene	< 2.0	µg/l
Carbazole	< 2.0	µg/l
Di-n-butylphthalate	< 2.0	µg/l
Fluoranthene	< 2.0	µg/l
Benzidine	<51.0	µg/l
Pyrene	< 2.0	µg/l
Butylbenzylphthalate	< 2.0	µg/l

Parameter	Results	Units
3,3-Dichlorobenzidine	< 3.1	µg/l
Benzo (a) anthracene	< 2.0	µg/l
Chrysene	< 2.0	µg/l
bis (2-Ethylhexyl) phthalate	< 2.0	µg/l
Di-n-octylphthalate	< 2.0	µg/l
Benzo (b) fluoranthene	< 2.0	µg/l
Benzo (k) fluoranthene	< 2.0	µg/l
Benzo (a) pyrene	< 2.0	µg/l
Indeno (1,2,3-cd) pyrene	< 4.1	µg/l
Dibenzo (a,h) anthracene	< 4.1	µg/l
Benzo (g, h, i) perylene	< 4.1	µg/l

APPENDIX F—EFFLUENT DATA FROM DMRS 2000 – 2004

DATES	BOD, CARBC AVG PERCENT	BOD, CARBC AVG LBS/DAY	BOD, CARBC AVG MG/L	BOD, CARBC AVW LBS/DAY	BOD, CARBC AVW MG/L	CHLORINE, T AVG LBS/DAY	CHLORINE, T AVG LBS/DAY	CHLORINE, T AVG MG/L	CHLORINE, T MAX MG/L	COLIFORM, F GEM #/100 ML	COLIFORM, F GM7 #/100 ML	COPPER, TC AVG LBS/DAY	COPPER, TO AVG UG/L	COPPER, MAX UG/L	COPPER, Average Mont MGD	COPPER, Maximum We MGD
1-Jan-00	98	15	4	19	5		6	0.15	0.34	44	148	0.006	1.8	3	0.44	0.5
1-Jan-00						0.5										
1-Feb-00	98	10	3	16	4		6	0.14	0.25	14	48	0	0	0	0.4	0.45
1-Feb-00						0.5										
1-Mar-00	96	33	9	148	13	C		0.2	0.4	40	54	0.018	5	9	0.43	0.45
1-Mar-00						0.8										
1-Apr-00	95	32	10	58	18		6	0.2	0.4	64	170	0.027	8	14	0.43	0.48
1-Apr-00						0.6										
1-May-00	98	15	4	20	6		6	0.1	0.2	58	179	0.054	12	17	0.42	0.46
1-May-00						0.4										
1-Jun-00	98	18	4	22	6		6	0.09	0.2	98	200	0.054	13	24	0.52	0.69
1-Jun-00						0.4										
1-Jul-00	98	17	4	22	5		6	0.1	0.2	67	121	0.03	7.5	9	0.5	0.56
1-Jul-00						0.4										
1-Aug-00	95	21	11	40	10		6	0.1	0.2	81	238	0.022	5.8	8	0.47	0.5
1-Aug-00						0.3										
1-Sep-00	97	26	8	33	11		6	0.09	0.27	134	288	0.034	10.8	14	0.4	0.41
1-Sep-00						0.3										
1-Oct-00	98	13	4	17	5		6	0.11	0.16	36	110	0.031	9	11	0.4	0.41
1-Oct-00						0.4										
1-Nov-00	98	14	4	28	7		6			4	83	0.056	7	9	0.39	0.44
1-Dec-00	98	15	5	22	6		6			1	1	0.022	7	7	0.4	0.42
1-Jan-01	98	17	5	25	8	E				1.2	1.8	0.016	5	6	0.43	0.55
1-Feb-01	98	13	4	22	8		6			8	17	0.022	7	10	0.4	0.46
1-Feb-01						E										
1-Mar-01	98	12	4	20	5		6			2	11	0.03	9	10	0.44	0.51
1-Mar-01						C										
1-Apr-01	99	12	3	16	4	C				1	4	0.024	7	8	0.44	0.51
1-May-01	98	18	4	22	5	C				4	17	0.018	4	7	0.5	0.56
1-Jun-01	98	15	4	20	5	E				10	66	0.016	4	7	0.47	0.52
1-Jul-01	98	16	4	23	6		6			6	16	0	0	0	0.43	0.44
1-Jul-01						E										
1-Aug-01	97	23	6	28	8	E				22	102	0.006	1.6	2	0.44	0.47
1-Sep-01	99	17	5	20	6		6			34	214	0.009	3	4	0.41	0.42
1-Oct-01	98	13	4	22	6					3	14				0.45	0.52
1-Oct-01													8.2	10		
1-Nov-01	99	11	2	14	2					2	7		9	13	0.64	0.75
1-Dec-01	99	11	2	18	2					1.2	1.4		5	7	0.73	1.02
1-Jan-02	98	17	4	36	5					0.8	7		2	6	0.61	0.76
1-Feb-02	98	16	4	22	6					0.9	7		10	14	0.53	0.58
1-Mar-02	98	13	3	24	4					0.4	0.5		11	12	0.52	0.57
1-Apr-02	98	16	4	24	6					2.6	21.3		11	15	0.63	0.88
1-May-02	98	12	3	16	4					1.2	11.8		7	8	0.52	0.61
1-Jun-02	98	15	3	21	4	E				2.9	7.3		8	10	0.58	0.6
1-Jul-02	99	10	3	15	4					4.6	5.9		7.6	11	0.48	0.52
1-Aug-02	98	13	4	17	6					6	18		9	11	0.41	0.42
1-Sep-02	98	15	5	18	6					13	22		6	12	0.37	0.39
1-Oct-02	98	9	4	13	5					44	82		9	10	0.32	0.33
1-Nov-02	98	13	4	16	6					10	18		11	14	0.34	0.39
1-Dec-02	98	13	4	16	6					33	65		9.5	11	0.38	0.46
1-Jan-03	96	32	7	64	10					94	144		18	29	0.6	1.14
1-Feb-03	96	36	7	87	14					142	514		22	35	0.55	0.76
1-Mar-03	98	29	5	40	6					4	14		12	16	0.67	0.78
1-Apr-03	98	23	5	32	7					8	14		12.6	17	0.55	0.62
1-May-03	97	22	6	30	8					6	29		8	9	0.43	0.48
1-Jun-03	98	11	3	13	4					21	50		9	11	0.4	0.42
1-Jul-03	98	8	3	11	4					23	70		12	13	0.35	0.36
1-Aug-03	98	10	3	12	4					33	65		12	12	0.37	0.38
1-Sep-03	99	9	3	15	5					2	27		10	12	0.4	0.42
1-Oct-03	98	18	4	42	5					12	39		7	11	0.5	0.79
1-Nov-03	98	18	3	45	5					2	8		7	12	0.64	0.93
1-Dec-03	98	17	4	22	4					4.4	19.9		4	6	0.57	0.67
1-Jan-04	98	17	4	25	4					2.1	3.8		9	10	0.66	0.94
1-Feb-04	99	5	1	6	2					0.8	2.3		7	11	0.49	0.72
1-Mar-04	98	10	3	12	4					1.4	4.3		7	9	0.44	0.46
1-Apr-04	98	13	4	15	4					15	29		8.8	11	0.42	0.43
1-May-04	98	10	3	14	4					9.1	10.6		10	11	0.42	0.48
1-Jun-04	98	11	3	14	4					6.1	14		10	12	0.45	0.52
1-Jul-04	99	11	3	14	4					25.3	34.1		10.2	14	0.43	0.46
1-Aug-04	99	13	3	14	4					24.6	40.2		0	0	0.47	0.55
1-Sep-04	99	12	3	14	4					13.7	24.5		16	22	0.47	0.49
1-Oct-04	99	10	3	12	4					12.9	17		42	45	0.41	0.43
1-Nov-04	99	10	3	17	4					9.5	15.4		6.8	9	0.44	0.51
1-Dec-04	98	12	3	22	4					2.7	7.7		28.6	33	0.55	0.7

APPENDIX F (*Continued*)— EFFLUENT DATA FROM DMRS 2000 – 2004

DATES	MERCURY, T	MERCURY, T	NITROGEN, A	NITROGEN, A	NITROGEN, A	NITROGEN, A	PH	PH	SILVER, TOT	SILVER, TOT	SILVER, TOT	SOLIDS, SUS	SOLIDS, TOT	SOLIDS, TOT	SOLIDS, TOT	SOLIDS, TOTAL SUSPEND
	AVG	MAX	AVG	AVG	MAX	MAX	MAX	MIN	AVG	AVG	MAX	AVG	AVG	AVG	AVW	MAX
	UG/L	UG/L	LBS/DAY	MG/L	LBS/DAY	MG/L	S.U.	S.U.	LBS/DAY	UG/L	UG/L	PERCENT	LBS/DAY	MG/L	LBS/DAY	MG/L
1-Jan-00	0	0	3.5	0.1			6.9	6.7	0	0	0	98	9	3	12	4
1-Jan-00																
1-Feb-00	0	0	1.2	0.37			7	6.9	0	0	0	99	6	2	8	2
1-Feb-00																
1-Mar-00	0	0	42	11.6			7.2	7	0.001	0.14	0.3	96	25	7	41	11
1-Mar-00																
1-Apr-00	0	0	27.8	8.8			7	6.7	0.005	0.35	0.8	95	18	6	45	14
1-Apr-00																
1-May-00	0	0	0.5	0.12			6.6	6.3	0	0	0	97	19	5	30	8
1-May-00																
1-Jun-00	0	0	0.6	0.14			6.6	6.3	0	0.1	0.2	98	12	3	22	4
1-Jun-00																
1-Jul-00	0	0	0.12	0.03			6.8	6.4	0.001	0.4	0.6	99	8	2	11	2
1-Jul-00																
1-Aug-00	0	0	0.5	0.2	1.4		6.9	6.5	0.001	0.2	0.3	98	14	4	28	8
1-Aug-00																
1-Sep-00	0	0	4	1.2	14.7		6.7	6.5	0	0.08	0.3	98	14	5	20	6
1-Sep-00																
1-Oct-00	0	0	0.028	0.02	0.1		6.6	6.4	0	0	0	98	10	3	16	6
1-Oct-00																
1-Nov-00	0	0	0.1	0.03			6.7	6.5	0	0	0	98	9	3	12	4
1-Dec-00	0	0	0.2	0.07			6.7	6.4	0	0	0	98	5	2	8	2
1-Jan-01	0	0	0.2	0.07			6.6	6.4	0	0	0	98	10	3	12	4
1-Feb-01	0	0	0.3	0.1			6.7	6.3	0	0	0	99	10	2	12	3
1-Feb-01																
1-Mar-01	0	0	0.8	0.2			6.9	6.4	0	0	0	98	12	3	14	4
1-Mar-01																
1-Apr-01	0	0	0.5	0.14			6.5	6.3	0.001	0.3	0.4	98	12	3	23	6
1-May-01	0	0	0.7	0.16			6.6	6.3	0.001	0.2	0.4	97	15	4	26	6
1-Jun-01	0	0	0.5	0.14			6.7	6.4	0	0	0	97	17	4	22	6
1-Jul-01	0	0	1.3	0.2			6.8	6.5	0.002	0.5	2	97	14	4	16	4
1-Jul-01																
1-Aug-01	0.08	0.4	1.6	0.4	1.9		6.8	6.5	0	0.08	0.2	98	15	4	18	5
1-Sep-01	0	0	1.4	0.4	2		6.8	6.3	0	0	0	97	22	6	36	11
1-Oct-01	0.2	1	1.2	0.3	1.5		6.8	6.3	0	0	0	98	14	4	18	6
1-Oct-01																
1-Nov-01	0	0	0.49	0.11		0.15	6.4	6.2	0	0	0	98	16	3	20	4
1-Dec-01	0	0		0.04		0.08	6.4	6.2	0	0	0	98	19	3	28	4
1-Jan-02	0	0		0.2		0.4	6.5	6.3	0	0	0	97	20	4	36	6
1-Feb-02	0	0		0.02		0.05	6.5	6.2	0	0	0	96	25	6	30	8
1-Mar-02	0	0		0.03		0.06	6.3	6.1	0	0	0	97	16	4	20	6
1-Apr-02	0	0		0.3		0.87	6.4	6.2	0	0	0	97	17	4	18	4
1-May-02	0	0		0.3		0.4	7.2	6.5	0	0	0	97	16	4	20	4
1-Jun-02	0	0		0.14		0.24	7.1	7	0	0	0	97	23	5	31	6
1-Jul-02	0	0		0.29		0.51	7.1	6.8	0	0	0.002	97	23	6	32	8
1-Aug-02	0	0	0.9	0.26	1.9		7.2	7.1	0	0	0	97	16	5	27	8
1-Sep-02	0	0	1.6	0.5	2.8		7.2	7	0	0	0	97	18	6	22	6
1-Oct-02	0.2	0.4	0.3	0.1	0.6		7	6.9	0	0.1	0.3	98	10	4	12	8
1-Nov-02	0	0		0.31		0.43	7.3	7	0	0	0	98	10	4	18	6
1-Dec-02	0	0		0.37		0.79	7.4	6.9	0	0.1	0.4	98	14	4	22	6
1-Jan-03	0	0		0.7		3	7.1	6.9	0	0	0	93	54	10	156	19
1-Feb-03	0	0		5.9		14	7.3	6.8	0	0	0	94	34	7	67	10
1-Mar-03	0	0		0.3		0.8	7.1	6.8	0	0	0	95	35	6	72	10
1-Apr-03	0	0		0.3		1.6	7	6.6	0	0	0	96	29	6	39	8
1-May-03	0	0		0.2		0.3	6.8	6.6	0	0	0	95	30	8	45	13
1-Jun-03	0	0		0.5		0.7	6.8	6.6	0	0	0	96	14	4	22	6
1-Jul-03	0	0		0.2		0.6	7	6.6	0	0	0	98	9	3	12	4
1-Aug-03	0	0	0.3	0.1	0.5		7.4	6.4	0	0	0	98	12	4	14	5
1-Sep-03	0	0	1	0.3	1.4		6.9	6.6	0	0	0	99	8	2	8	2
1-Oct-03	0	0	1.31	0.3	2.5		7.1	6.6	0	0	0	98	14	4	20	7
1-Nov-03	0	0		1.6		6.4	7.1	6.5	0	0	0	96	35	5	108	12
1-Dec-03	0	0		0.06		0.28	7.2	6.9	0	0	0	98	16	3	20	4
1-Jan-04	0	0		0.01		0.05	7.2	7	0	0	0	98	14	3	16	4
1-Feb-04	0	0		0.08		0.09	6.8	6.8	0	0	0	99	4	1	6	2
1-Mar-04	0	0		0		0	7.4	6.7	0	0	0	98	11	3	20	5
1-Apr-04	0	0		0.05		0.05	7.1	6.7	0	0	0	97	18	5	24	6
1-May-04	0	0		0.1		0.1	6.8	6.3	0	0	0	98	12	4	14	4
1-Jun-04	0	0		0.08		0.12	7.1	6.7	0	0	0	98	12	3	29	7
1-Jul-04	0	0		0.3		0.5	7	6.6	0	0	0	98	16	3	30	4
1-Aug-04	0	0	0.58	0.14	0.67		7	6.7	0	0	0	99	10	2	14	4
1-Sep-04	0	0	0.3	0.07	0.4		7.1	6.7	0	0	0	98	13	3	22	6
1-Oct-04	0	0	0.68	0.2	2		7.1	6.8	0	0	0	98	9	3	10	4
1-Nov-04	0	0		0.05		0.13	6.9	6.5	0	0	0	98	10	3	3	4
1-Dec-04	0.08	0.4		1		4.8	7	6.6	0	0	0	98	11	2	19	4

APPENDIX G—EPA "PART D" NPDES APPLICATION TESTING REQUIREMENTS

The following pollutant scan data are required at time of NPDES permit application for municipal treatment facilities with design flow greater than 1.0 mgd. At least three scans are required, conducted during the term of the previous permit.

METALS & MISC.	VOL. ORGANICS (Cont.)	BASE NEUTRALS (Cont.)
Antimony	Ethylbenzene	Bis (2-Chloroethyl)-Ether
Arsenic	Methyl Bromide	Bis (2-Chloroiso-Propyl) Ether
Beryllium	Methyl Chloride	Bis (2-Ethylhexyl) Phthalate
Cadmium	Methylene Chloride	4-Bromophenyl Phenyl Ether
Chromium	1,1,2,2-Tetrachloro-Ethane	Butyl Benzyl Phthalate
Copper	Tetrachloro-Ethylene	2-Chloronaphthalene
Lead	Toluene	4-Chlorphenyl Phenyl Ether
Mercury	1,1,1-Trichloroethane	Chrysene
Nickel	1,1,2-Trichloroethane	Di-N-Butyl Phthalate
Selenium	Trichlorethylene	Di-N-Octyl Phthalate
Silver	Vinyl Chloride	Dibenzo(A,H) Anthracene
Thallium		1,2-Dichlorobenzene
Zinc	**ACID EXTRACTABLES**	1,3-Dichlorobenzene
Cyanide	P-Chloro-M-Cresol	1,4-Dichlorobenzene
Total Phenolic Compounds	2-Chlorophenol	3,3-Dichlorobenzidine
Hardness (As $CaCO_3$)	2,4-Dichlorophenol	Diethyl Phthalate
	2,4-Dimethylphenol	Dimethyl Phthalate
VOLATILE ORGANICS	4,6-Dinitro-O-Cresol	2,4-Dinitrotoluene
Acrolein	2,4-Dinitrophenol	2,6-Dinitrotoluene
Acrylonitrile	2-Nitrophenol	Fluoranthene
Benzene	4-Nitrophenol	Fluorene
Bromoform	Pentachlorophenol	Hexachlorobenzene
Carbon Tetrachloride	Phenol	Hexachlorobutadiene
Clorobenzene	2,4,6-Trichlorophenol	Hexachlorocyclo-Pentadiene
Chlorodibromo-Methane		Hexachloroethane
Chloroethane	**BASE NEUTRALS**	Indeno(1,2,3-CD)Pyrene
2-Chloro-Ethylvinyl Ether	Acenaphthene	Isophorone
Chloroform	Acenaphthylene	Naphthalene
Dichlorobromo-Methane	Anthracene	Nitrobenzene
1,1-Dichloroethane	Benzidine	N-Nitrosodi-N-Propylamine
1,2-Dichloroethane	Benzo(A)Anthracene	N-Nitrosodi-Methylamine
Trans-1,2-Dichloro Ethylene	3,4 Benzo-Fluoranthene	N-Nitrosodi-Phenylamine
1,1-Dichloroethylene	Benzo(Ghi)Perylene	Phenanthrene
1,2-Dichloropropane	Benzo(K)Fluoranthene	Pyrene
1,3-Dichloro-Propylene	Bis (2-Chloroethoxy) Methane	1,2,4-Trichlorobenzene

APPENDIX H—RESPONSE TO COMMENTS

CITY OF NORTH BEND

"Excellence in Government – Pride in Service"

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DEPT OF ECOLOGY

October 28, 2005

Tricia Miller
Department of Ecology
3190 160th Avenue SE
Bellevue, WA 98008-5452

Re: NPDES Permit No. WA-002935-1
City of North Bend WWTP

Dear Ms Miler:

The City is in receipt of the draft NPDES permit for our wastewater treatment plant. I have routed it to our consultants and plant operator. The following are comments on the permit for consideration. I have not had the opportunity to review it and will be gone for much of the next two weeks. I would like an opportunity after that to provide comment which would be beyond the November 4, 2005 deadline in your October 13 letter.

1. The plant design criteria shown on page 13 of the draft permit, and on page 12 of the Fact Sheet, came from Table 9.1 of the 1996 Engineering Report, except the flow number, which is simply the current influent pump capacity of 2.40 mgd. The maximum month BOD is listed at 2,805 pound per day, which is close to our current rating of 2,800 pounds per day, as shown on the updated Table 8-2, dated 6/14/05.

   The value for "Average Flow for Maximum" listed in the Permit at 1.17 mgd, is really "Monthly Average Dry Weather Flow", as listed in the Fact Sheet. This number may have came from the revised Table 8-2. It is not a plant design criteria, but is simply a prediction of what the value will be in year 2010. We do not believe that this should be a "Design Standard", as it is not a flow that was used to size any plant components.

2. As shown on the Table on page 21 of the Fact Sheet, all of the effluent standards are higher than they were under the old permit, even for the limits when Carnation and Fall City come on line, **EXCEPT, "Average Week CBOD"**.

   Table 1, on the following page, shows the old and new limits for the significant parameters. These are expressed in both pounds per day and mg/l, based on a dry weather flow of 1.17 mgd, and a wet weather flow of 2.40 mgd.

   The Dry Weather period, Average Week CBOD value is now based on the TMDL allocation. At a summer flow of 1.17 mgd, the required concentration is 26.3 mg/l., which is still higher than the technology-based standard of 25 mg/l. So this is OK for this permit

City Hall 211 Main Ave. N. Phone (425) 888-1211 Fax (425) 831-6200
Community Services 126 E. Fourth St. Phone (425) 888-5633 Fax (425) 888-5636
Fire Department 112 W. Second Phone (425) 888-0242 Fax (425) 888-5275
Public Works 1155 E. North Bend Way Phone (425) 888-0486 Fax (425) 888-3502
Sheriff's Office 1550 Boalch Ave. NW Phone (425) 888-4433 Phone (206) 296-0612 Fax (206) 296-0929
P.O. Box 896, North Bend, WA 98045 http://ci.north-bend.wa.us

cycle. However, as the summer flows increase in the future beyond 1.17 mgd, the concentration will have to come down proportionately, to meet the mass load requirement.

Table 1
North Bend NPDES Permit

Criteria	Previous Limit	Proposed Limit w/ Carnation & Fall City
Dry Weather Period		
CBOD, Average Month, lbs/day	192	244
CBOD, Average Month, mg/l @ 0.92mgd	25.0	
CBOD, Average Month, mg/l @ 1.17mgd		25.0
CBOD, Average Week, lbs/day	307	257
CBOD, Average Week, mg/l @0.92 mgd	40.0	
CBOD, Average Week, mg/l @1.17 mgd		26.3
Ammonia, Average Month, lbs/day	6.00	6.64
Ammonia, Average Month, mg/l @ 0.92 mgd	0.782	0.865
Ammonia, Maximum Day, lbs/day	20.25	20.25
Ammonia, Maximum Day, mg/l @ 0.92 mgd	2.64	2.64
Wet Weather Period		
CBOD, Average Month, lbs/day	221	500
CBOD, Average Month, mg/l @ 0.81 mgd	32.7	
CBOD, Average Month, mg/l @ 2.35 mgd		25.5

Indicates TMDL based

3. The derivation of the TMDL mass load limit for Average Dry Weather Week CBOD= 257 lbs/day is discussed on page 14 of the Fact Sheet. As discussed in the TMDL document, this limit is based on both Carnation and Fall City discharging into the river. Only Carnation is planning on discharging this permit cycle, so this limit technically should be somewhat greater.

4. On page 4 of the Permit, the date for condition S3A has already passed.

5. Condition S2 requires monitoring of ammonia all year. Since the effluent ammonia limit is only applicable during August, September and October, why test in the winter?

6. Condition S2 also requires testing for effluent copper, silver, zinc and phosphorus, none of which have permit limits, and all of which require 24-hour composite samples. If we must test for these, can they be grab samples, to be in compliance with previous Court Order?

If you have any questions about these comments, please contact Jeff Howard at Berryman & Henigar at (206) 505-3400 or Doug Repp, Plant Operator, at (425) 888-7075.

Sincerely,

Ronald Garrow

Ronald Garrow, P.E.
PW Director/City Engineer

C: Jeff Howard
Doug Repp

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

March 15, 2006

Mr. Ron Garrow
City of North Bend
P. O. Box 896
North Bend, WA 98045

Re: Response to Comments on Draft NPDES Permit No. WA-002935-1
City of North Bend Wastewater Treatment Plant

Thank you for your comments dated October 28, 2005 on the above referenced permit. A thorough review has been made of your comments, and we offer the following responses. The following responses are outlined in the same format as presented in your letter.

1. You are correct. The plant design criteria listed in the permit and fact sheet were taken from Table 9.1 of the 1996 Engineering Report, with the exception of the flow value, which is based on the current influent pump capacity of 2.4 mgd. According to the revised Table 8.2 in the Final Comprehensive Sewer Plan dated June 14, 2005, the influent BOD loading for the maximum month following completion of Phase II is 1986 lbs/day, not 2,800 lbs/day.

   The monthly average dry weather flow of 1.17 mgd comes from the revised Table 8.2 of the Final Comprehensive Sewer Plan dated June 14, 2005. The Department agrees that this is not a plant design criterion, and it will be removed from Table 1 under Design Criteria on page 12 of the permit. Nevertheless, this dry weather flow (1.17 mgd) is appropriate to be used for the conversion calculation between the concentration-based and mass-based limits for the low flow period for TSS (see page 21 of the fact sheet).

2. An error was made in calculating the mass-based average monthly limits for $CBOD_5$, shown on page 21, for both proposed effluent limits before and after Carnation WWTP comes on line. The mass-based average monthly limits for $CBOD_5$, (in S1 of the permit, and on page 21 of the fact sheet) were based on a technology-based concentration limit of 25 mg/L, using the average monthly dry weather flow of 1.17 mgd. This is incorrect. The mass-based average monthly limits for $CBOD_5$ should be derived from the Total Maximum Daily Load-based (TMDL) limits of 307 lb/day and 257 lb/day for both the before and after scenarios with respect to Carnation WWTP coming on line. In addition, the previous and the current proposed draft permit listed the TMDL mass-based limits for $CBOD_5$ as Average Weekly limits, which is incorrect as well, because the TMDL limits are Maximum Daily Limits. To clarify this, the Department proposes to separate the concentration-based limits from the TMDL mass-based limits in the table. Thus, the effluent limits table listed in S1 of the permit will look as follows:

Interim Effluent Limitations Low River Flow Period

EFFLUENT LIMITATIONS[a]: OUTFALL #001		
Parameter	**Average Monthly**	**Average Weekly**
Carbonaceous Biochemical Oxygen Demand (5-day)	25 mg/L	40 mg/L
Total Suspended Solids	30 mg/L (293 lb/day)	45 mg/L (439 lb/day)
Fecal Coliform Bacteria	200 cfu/100 mL	400 cfu/100 mL
pH[b]	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Parameter	**Average Monthly**	**Maximum Daily[c]**
Carbonaceous Biochemical Oxygen Demand (5-day)	179 lbs/day TMDL-Based Limit	307 lbs/day TMDL-Based Limit
Total Ammonia (as N)	8.4 lbs/day TMDL-Based Limit	20.25 lbs/day TMDL-Based Limit
Mercury (Total Recoverable)	0.2 µg/L	0.4 µg/L
[a] The average monthly and weekly effluent limitations are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.		
[b] Indicates the range of permitted values. The instantaneous maximum and minimum pH shall be reported monthly.		
[c] The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For other units of measurement, the daily discharge is the average measurement of the pollutant over the day.		

Final Effluent Limitations Low River Flow Period

EFFLUENT LIMITATIONS[a]: OUTFALL #001		
Parameter	**Average Monthly**	**Average Weekly**
Carbonaceous Biochemical Oxygen Demand (5-day)	25 mg/L	40 mg/L
Total Suspended Solids	30 mg/L (293 lb/day)	45 mg/L (439 lb/day)
Fecal Coliform Bacteria	200 cfu/100 mL	400 cfu/100 mL
pH[b]	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Parameter	**Average Monthly**	**Maximum Daily[c]**
Carbonaceous Biochemical Oxygen Demand (5-day)	150 lbs/day TMDL-Based Limit	257 lbs/day TMDL-Based Limit
Total Ammonia (as N)	8.4 lbs/day TMDL-Based Limit	20.25 lbs/day TMDL-Based Limit
Mercury (Total Recoverable)	0.2 µg/L	0.4 µg/L
[a] The average monthly and weekly effluent limitations are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.		
[b] Indicates the range of permitted values. The instantaneous maximum and minimum pH shall be reported monthly.		
[c] The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For other units of measurement, the daily discharge is the average measurement of the pollutant over the day.		

Therefore, the dry weather flow rate would not have a bearing on the TMDL mass-based limits. No TMDL concentration-based limits for $CBOD_5$ will be set in the permit, only the technology concentration-based limits and the TMDL mass-based limits.

3. The Snoqualmie River TMDL Study dated May 1994 was approved by EPA Region X. In this study, two scenarios were presented and approved, one for expansion of three existing WWTPs only (North Bend, Snoqualmie, and Duvall), and one for five plants including two additional WWTPs (Carnation and Fall City). Even though Fall City has no current plans to construct a WWTP, the approved TMDL loadings for each plant cannot be changed, as those loadings were approved by EPA-Region X, unless the Department conducts another TMDL Study for Snoqualmie River excluding the potential Fall City WWTP.

4. The submittal dates listed in S3 and other parts of the permit will be changed accordingly, depending on the issuance date of the final permit.

5. The Department agrees with your comment. The monitoring requirements for ammonia during High River Flow Period are not necessary, monitoring is required only during the Low River Flow Period (August, September and October), as the ammonia concentration in the river is restricted during the summer months.

6. Monthly monitoring requirements for copper, silver, and zinc are necessary because the calculation of reasonable potential to exceed Water Quality Criteria shown on Table 1, on page 34 of the fact sheet, indicates that the concentrations at the acute zone are close to the water quality standards. In addition, the Permittee is required to sample and analyze these metals for the application for permit renewal. These data will be used to determine reasonable potential to exceed water quality criteria. Thus, it is beneficial for the facility to have adequate data to be used to conduct this evaluation, as the evaluation is largely dependent on the coefficient of variation of the data.

   The facility is currently equipped and has the capability to collect 24-hour composite samples, and as composite samples are more representative than grab samples, the Department proposes that the facility be required to conduct composite sampling for metals.

   The Department agrees that monitoring for phosphorous is not necessary. Thus, the monitoring requirement for phosphorous will be removed from the permit.

In addition to your comments above, the Department has made the following changes in the permit and fact sheet.

I. Monitoring requirements for temperature in the effluent:
On June 30, 2003, the Department adopted amendments to Chapter 173-201A WAC, which include new temperature criteria. EPA-Region X has approved a portion of those new rules but has not yet granted approval of the new

temperature criteria. (They are in the process of reviewing the new criteria to ensure that the new criteria are at least as stringent as the federal criteria.) The new temperature criteria are more stringent than those contained in the existing regulation. According to the Department's record, the City of North Bend WWTP has never been required to monitor for temperature in the effluent. As the new temperature criteria will come in effect once they are approved by EPA-Region X, all discharges will be required to be in compliance with the new criteria. Thus, the Department believes that it is beneficial for the City to start monitoring and collecting temperature data for the effluent. The data can be used to determine the compliance status of the WWTP. The Department proposes that the Permittee monitor the temperature for a period of one year, and then evaluate the data for the next step. You will find this language listed in footnote "g" which reads as follows:

"[g] The Permittee shall monitor the effluent temperature daily for a period of one year. If data indicate non-compliance with the new temperature criteria, the Department may require monitoring to be continued and modify the permit to include additional requirements to ensure that future compliance with the new temperature criteria is achieved."

II. Clarification to the sampling frequency for wastewater monitoring for part D of the NPDES permit application (page 10 of the permit)

The existing language reads "3/permit term". The Department proposes the language be clarified to read as "3 during 2010".

The draft permit and fact sheet will be finalized with the changes as mentioned above. An electronic copy of the final draft permit and fact sheet will be sent to you for review for a period of two weeks. The Department proposes to issue the final permit and fact sheet to the City by the end of March. If you have any questions, please contact me via e-mail at jtra461@ecy.wa.gov or by telephone (425) 649-7078.

Sincerely,

Jeanne Tran, P.E.
Water Quality Engineer

Cc: Central File WQ1.1